Tampa Harbor & HarborSym

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HarborSym Development Team

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  - Decision Methodologies Division
  - Navigation Analysis Division
- Jacksonville District
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  - Cincinnati, Ohio
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HarborSym History

- IWR modeling philosophy:
  - Transparency
  - Portability
  - Ease of use
- Initial application: Sabine Neches Waterway, Galveston District, 2002
- **GOAL:** Generic Corps-wide model

HarborSym & Tampa Harbor

- Partnership began 2/2003
- Problem: widening study to reduce transit delays
- Needed additional features beyond Sabine version

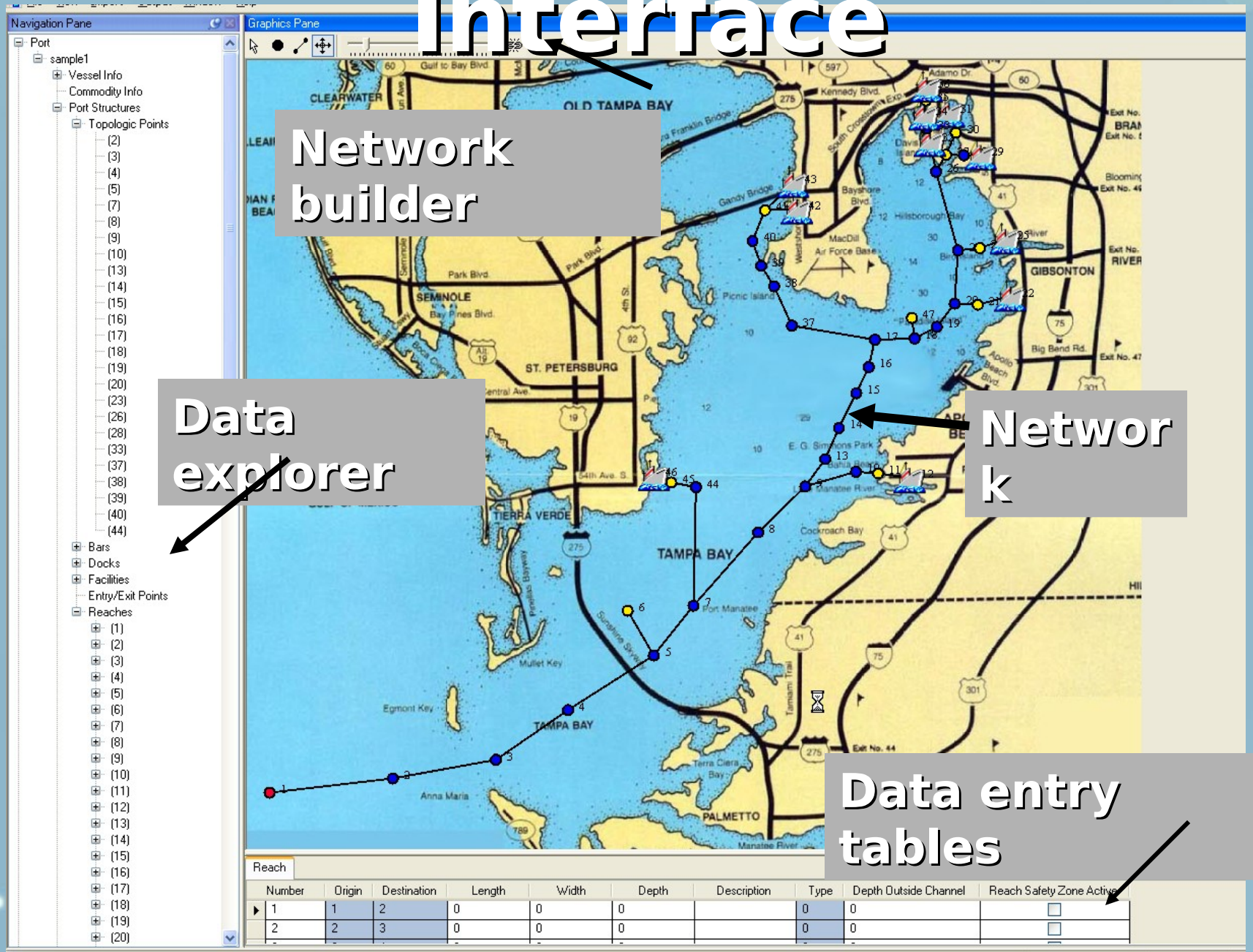
TAMPA HARBOR

- Passing restrictions
- Protocol vessels
- Safety vessels

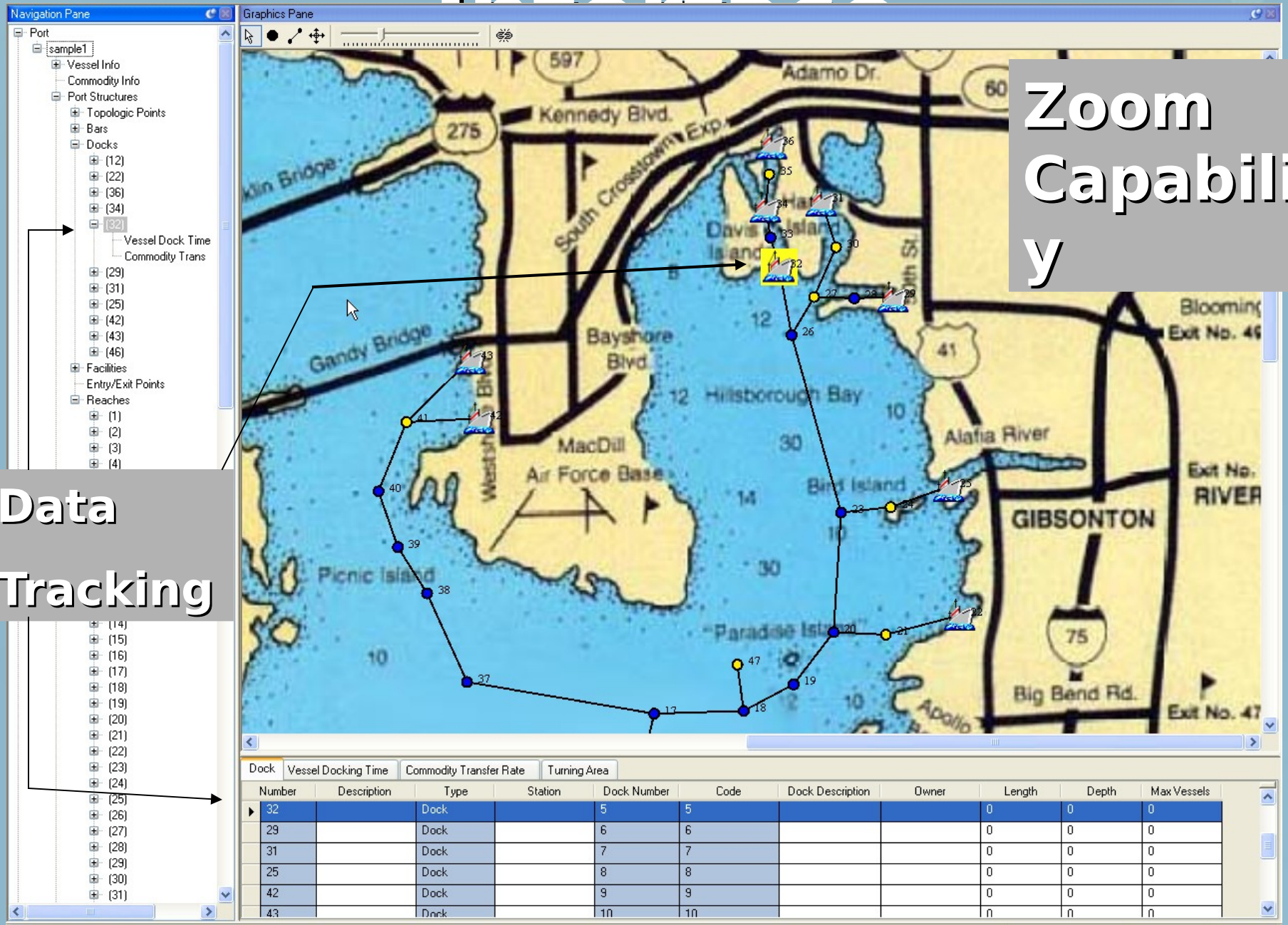
Major Model Enhancements

- Graphical user interface
- Tidal influences
- Vessel generator
- Multiple dock movements
- Priority Vessels
- Safety Zones

Graphical User Interface



Graphical User Interface



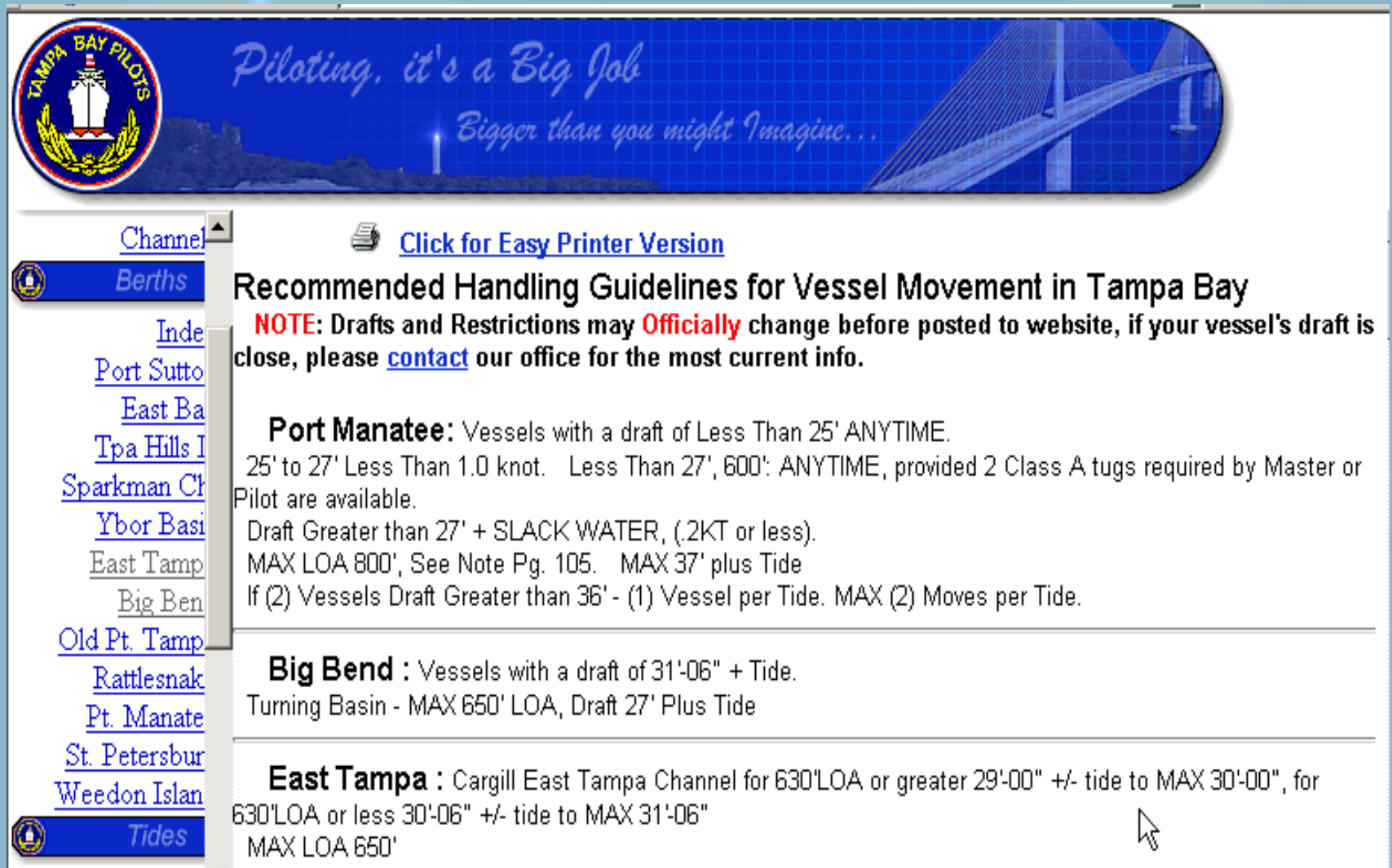
Zoom Capability

Data Tracking

Incorporating Tide & Current

- Vessels use tide in Tampa
- Pilots' tide & current rules
  - **Passage restricted to maximum vessel draft + tide**
  - **No movement allowed for certain vessels if current in reach > X**
- Translated into HarborSym reaches

Tidal Rules


TAMPA BAY PILOTS
Piloting, it's a Big Job
Bigger than you might Imagine...
Channel
Berths
Inde
Port Sutto
East Ba
Tpa Hills I
Sparkman Ch
Ybor Basi
East Tamp
Big Ben
Old Pt. Tamp
Rattlesnak
Pt. Manate
St. Petersbur
Weedon Islan
Tides
Click for Easy Printer Version
Recommended Handling Guidelines for Vessel Movement in Tampa Bay
NOTE: Drafts and Restrictions may Officially change before posted to website, if your vessel's draft is close, please contact our office for the most current info.
Port Manatee: Vessels with a draft of Less Than 25' ANYTIME.
25' to 27' Less Than 1.0 knot. Less Than 27', 600': ANYTIME, provided 2 Class A tugs required by Master or Pilot are available.
Draft Greater than 27' + SLACK WATER, (.2KT or less).
MAX LOA 800', See Note Pg. 105. MAX 37' plus Tide
If (2) Vessels Draft Greater than 36' - (1) Vessel per Tide. MAX (2) Moves per Tide.
Big Bend : Vessels with a draft of 31'-06" + Tide.
Turning Basin - MAX 650' LOA, Draft 27' Plus Tide
East Tampa : Cargill East Tampa Channel for 630'LOA or greater 29'-00" +/- tide to MAX 30'-00", for 630'LOA or less 30'-06" +/- tide to MAX 31'-06"
MAX LOA 650'

Tide Prediction

- Only astronomical (not meteorological) tides
- Harmonic Analysis
  - **Code Available**

    Xtide, Wxtide, Underkeel Clearance Model
- Tide Stations
  - **Primary station long term records used to develop constants**
  - **Secondary station prediction derived from Primary**
  - **Secondary provide lag/attenuation Factors (based on short term records)**

Tide Usage in HarborSym

- Generate external data files for a year, read by HarborSym
- Tide @ node interpolated based on nearest stations
- Evaluate tide rules for vessel movement, preclude movement if violation

Vessel Generator

Why?

- TOO MUCH DATA
- Difficult to create future vessel call lists
- Populate the model

Vessel Generator

Generated Calls - Data Requirements

- Future fleet estimate
  - **Specific fleet or vessel class population**
  - **# of vessels / # of possible calls (inter-arrival time)**
- Dock-level commodity forecast
- Constraints
  - **Vessel classes calling each dock**
  - **Vessel classes carrying each commodity**

Current Assumptions

- Each vessel call carries one commodity to/from a single dock
  - No intra-harbor movements
- Each vessel call is either import/export
- Yearly basis (no seasonality)
- Will be relaxed in later versions

Generated Calls Procedure

1. Allocation priority for vessel classes
2. Assign vessel calls from fleet to satisfy commodity forecasts (priority order)
3. Assign trip frequency based on inter-arrival time
4. Continue until forecast satisfied, or no more vessels available with trips

Vessel Generator

Reports:

- Unsatisfied demands
- Vessels used to satisfy demand
- Vessel Trips / Excess Fleet Capacity

Future Directions

Deepening Model

- Build upon existing vessel generator
- Transit rules to accommodate deepening behavior

Model Demonstration